

faculty, who here, as in all countries, are foremost in advocating the cause of sanatory reform, and who, with a total abnegation of self-interest, spend both time and money in endeavoring to prevent the consequences that must inevitably arise, either from the ignorance or culpable carelessness of those who are most interested.

Having pointed out the evil and its probable remedy, I would observe that, totally independent of the benefits that would arise from the cultivation of the swamp in a monetary point of view, it is a matter of paramount importance to get rid of existing and dangerous nuisances.

I lay these suggestions before the Institute, trusting that, in the importance of the subject, any imperfections will be overlooked; and that, in a short time, some active steps will be taken to remove those causes which, sooner or later, will operate with fearful effect in decimating our population.

ART. III.—*On the Hirudo Australis.* By Jos. BOSISTO, Esq., President of the Pharmaceutical Society of Melbourne.

[Read before the Institute, 5th May, 1858.]

THE difficulty of maintaining leeches in a healthy condition, away from their native waters, has induced me to make some experiments on the subject.

I have succeeded beyond my expectations, not only in preserving them from disease, and lowering the per-centage of deaths to a trifle, but also in their production apart from their native haunts.

This being the time of year when they yield their ova or cocoons, I thought, as the subject was novel, and partook of a scientific character, it might not be displeasing to exhibit specimens of some kinds of leech to be met with in this country, and the cocoons of the *Hirudo Australis*, as well as give the result of my observations on the preservation of the leech in general.

Leeches are to be found in most of the lagoons, pools, and creeks of this country, and although these contain a fair description of the blood-sucking leech, yet there are to be found those allied in appearance, as well as in the incapability of perforating the human skin, termed by Savigny the "*Hæmipis Sanguisorba*," or horse-leech.

The two descriptions of leech in general demand for blood-sucking are what are termed in Europe the green and the speckled, the latter being always preferred.

The description given of the former, by acknowledged authorities, agrees nearly with the green leech *found here*; whilst the speckled or true medicinal leech of Europe varies in appearance from that of the medicinal leech of Australia, whilst its capabilities for drawing blood, without causing inflammatory wounds, renders it equal, if not superior, to the one of northern Europe.

The green leech* is to be found in abundance in most of the swamps and pools, intermixed greatly with those of other genera; and in some instances the true Australian medicinal leech is also found intermixed, requiring therefore great attention in the sorting of them.

The best description of the medicinal leech in this country is to be found in the river Murray and its tributaries, and in no one instance have I met with, from these rivers, any description but that of the *Hirudo Australis*.

GENERAL CHARACTERS :*

Back, dark olive, and sometimes approaching black, with four well marked bright yellow longitudinal lines, quite dorsal, the two outer dorsal lines being much wider than the inner ones. The marginal lines of the back partake of the same color as the belly, which is a deep ochre yellow, occasionally intermixed with olive green spots, but generally without them. Eyes, at least eight; body, narrow, oval, with about 100 segments; belly, flat.

On comparing this with the medicinal leech of northern Europe, it will be observed that it varies somewhat.

A third kind of leech, often met with, a species of horse-leech, is characterised as follows: * back, light brown umber, with a jet black longitudinal line down its centre, with six scarcely perceptible lines of a slightly darker brown than the back, three on each side of the centre. Belly of the same color as the back. Eyes, ten. The leech, on the whole, oval.

The plan usually recommended and adopted by the continental leech gatherers for preservation for *a length* of time entirely fails in this country. They recommend keeping them in wooden or earthenware vessels half-filled with water, having a layer of turf moss and charcoal at the bottom;

* *Vide* plate accompanying Dr. Becker's Notes on Australian leeches in the present Volume.

others recommend water alone, changing it every second or third day.

Leeches, although very tenacious of life, become sickly soon, should the temperature be below 50 deg., or above 90 deg. Fah. Under 50 deg. they are liable to a disease which appears in the shape of a ring round the body, gradually tightening until it destroys life. Exposed to a high temperature, the water becomes speedily tainted and impure, as each leech throws off a slimy coat every fifth day; this alone is sufficient to destroy life, as the decomposition of animal matter is very rapid in a temperature so variable as ours.

The object of the charcoal is undoubtedly to prevent the rapidity of decomposition, as well as to assist them in extricating themselves from their worn-out coats; and the turf moss is useful for the same purpose as well as for food.

I am under the impression that their food consists not only of animalculæ and larvæ, but also of the coloring matter of the marls or clays. I have noticed that after remaining for some time in the yellow or blue clay, they assume a strong shade of either color.

The plan I adopt for their preservation is simple, natural, and every way successful. For their preservation and cultivation on a large scale, sink into the earth, in a place protected from the sun and weather, a given circle; bank well up the sides, and half fill with the finest red or blue marl or clay, made into the consistence of thick mud (the red clay is preferable), and in this place the leeches; cover it over with thin canvas or calico, to exclude from them the extreme rays of light, and occasionally sprinkle the top of the clay with fresh rain water. The leeches will make no attempt to rise above the surface of the clay, but suit themselves to the temperature by rising or sinking accordingly.

By this simple plan of keeping them, they are not only able to clear themselves of their mucous coat, but can supply themselves with such food as improves their condition, and renders them more fit for the purpose required of them.

The low lands of Germany, the lakes of Siberia, Bohemia, and other parts of Europe, which have supplied the markets for so long, are becoming rapidly exhausted.

The demand for leeches on the Continent, and also Great Britain, continues to be enormous. It has been computed that 600,000 are monthly imported into London, over 7,000,000 annually; and that 3,000,000 are annually consumed in Paris.

Having succeeded in adopting a plan for their preservation that requires no labour and but little attention, I see no reason why they should not prove a remunerative article of export from these colonies.

All that is required to ensure a safe passage to Great Britain for 1000 dozen is, that the clay should be of good quality, obtained some few feet from the surface, so as to be free from any impurity of the upper earth, moist, and packed in a half-cask of the diameter of 3 feet, the clay being 8 inches high, and occasionally moistening the top of the clay to prevent it becoming hard. Should any die, they will always be found on the surface, so that a change of clay is only necessary about every six months.

The cocoons I have the honour to exhibit to the members of this Institute this evening, are the production of the Murray leech, obtained from my own small conservatory, as before described—a proof sufficient that the plan I adopt is more in accordance with their mode of life than that I have previously mentioned.

They bury themselves in the clay, some 6 inches from its surface, when they deposit their ova, which, being attached to a small pebble or to the sides of the reservoir, gradually increases in size.

Dr. Johnson says the leech fixes itself to some object, and with its mouth fashions it into an oval body, called a cocoon.

These cocoons are said to contain from 3 to 18 leeches. I have not observed more than 3 or 4 enveloped in a brownish jelly-like fluid, at first appearing like small, black spots, but as the time approaches for their piercing the cocoon, they are found lying attached on the whole length of the inner side of the capsule, with the posterior sucker attached to the thinnest end of the cocoon, and in this manner they leave the capsule.

The cocoons, when perfect, vary in size from $\frac{5}{8}$ to 1 inch in length, the smallest weighing about 8 grains, and the largest 25 grains. They generally pierce the cocoon in about 40 days, if under a moderate temperature, but longer if kept at a low temperature.

Their weight, immediately after piercing the cocoon, is one grain; their appearance of a brownish red color. If taken then and kept in water, they die generally in a few days. Their growth is said to be very slow, and must be so, for my own observation shows them to increase at the rate of about 4 or 5 grains per annum.

Some of the cocoons now exhibited contain a less amount of the spongy coating over the capsule than others, evidently showing that one of its uses is to supply nourishment during their imprisonment, for by placing one of these in the sun for a day or two, the young leeches penetrate the cocoon.

I may state, in conclusion, that my observations have extended over five years.

ART. IV.—*Diagnostic Notes on New or Imperfectly Known Australian Plants.* By DR. FERDINAND MUELLER.

[Read before the Institute 26th May, 1858.]

OLACINEÆ.

Ximenia exarmata.

GLABROUS, thornless; leaves herbaceous, ovate or oblong, almost blunt; peduncles generally 3-7-flowered, rarely 1-2-flowered; petals outside smooth.

On low stony ridges near the rivers Sutter and Mackenzie.

A tall shrub with spreading branches. Leaves flat, 1-2 inches, petioles 3-4 lines long. Petals lanceolate, yellowish, $2\frac{1}{2}$ lines long, inside white-bearded. Filaments hardly 1 line long, glabrous. Anthers $1\frac{1}{2}$ line long, linear. Style short, glabrous.

Evidently, according to Forster's brief description, allied to the New Caledonian *Ximenia elliptica*. The genus was previously unknown as Australian.

ERYTHROXYLEÆ.

Erythroxylon Australe.

Glabrous; stem shrubby; leaves small, obovate or oblong, cuneate, blunt, flat, opaque, nearly membraneous, with indistinct areolate veins, and a short petiole; their lower side paler; stipules membraneous, deciduous, as long or shorter than the leafstalk, combined into a solitary deltoid binerved one; peduncles as long as the flowers, solitary or in fascicles, at the base with two deltoid or round bracteols; lobes of the deeply five-cleft calyx deltoid lanceolate; petals ovate-orbicular; styles 3, rarely 4, free; stigmas hemispherical; drupe ovate, red, three-celled.